Textbook Assignment: "Plane Table Topography and Map Projection." Pages 9-1 through 9-23.

Learning Objective: Describe the methods and procedures used to locate topographic details in the field and to produce a topographic map using a plane table and alidade.

8-1. Surveyors prefer the plane-table method for which of the following reasons?

1. Provides a nearly complete map
2. Works well in poor lighting
3. Requires the least amount of equipment
4. Provides quick setup and easy movement

8-2. The plane table method is advantageous under which of the following conditions?

1. Surveying hilly terrain
2. Drawing a large-scale map
3. Plotting a large number of irregular lines in open country
4. Working in a very humid climate

8-3. The note keeper on a plane-table survey party is responsible for what tasks?

1. All computations
2. Preparing the sketches
3. Assisting the rodman
4. Operating the alidade

8-4. What type of alidade is preferred for topography?

1. Open sight
2. Telescopic
3. Self-leveling
4. Direct reading

8-5. The term *table orientation* is defined by which of the following statements ?

1. Table alignment and orientation
2. Sight and point alignment using the alidade blade
3. Scope orientation with paper rotation
4. Table rotation and eye alignment

8-6. What method of marking your point on your sketch is recommended?

1. Use the decimal point in your horizontal distance
2. Use the 0 symbol
3. Use an "X"
4. Use the decimal point of the elevation

8-7. Orientation by backsighting is accomplished by what method?

1. By sighting on an established bench mark
2. By plotting a traverse line once you set up
3. By using a plotted established line
4. By balancing all your shots

8-8. Orientating the plane table by compass is recommended for what type of mapping?

1. Accurate small scale
2. Accurate large scale
3. Rough large scale
4. Rough small scale

8-9. Which of the following items may affect the orientation of the plane table by compass?

1. Local attraction
2. The earth's magnetic field
3. Both 2 and 3 above
4. Electrical parallax

8-10. Orientation of the plane table by resection requires the instrument to be set up over one of the points used .

1. True
2. False

8-11. The two-point method of resection refers to using two known points without setting up on either point to align the plane table.

1. True
2. False

8-12. The three-point method is used when you have three known points that

1. cannot be seen from all points
2. are aligned
3. cannot be conveniently occupied
4. are outside the triangle of error

8-13. Using the three-point method, the table is not normally aligned on the first attempt. This misalignment causes what situation?

1. Triangle of closure
2. Triangle of error
3. Pythagorean triangle
4. Open triangle

8-14. In the three-point method certain conditions must be met. Which of the following statements is one of the conditions?

1. The point will not be on the same side of all the rays
2. If the error is inside your triangle, the point will be outside the triangle
3. The point will fall to the left of all rays or right of all rays
4. The point is located by bisecting perpendicular lines

8-15. The tracing-cloth method is an example of which of the following types of orientation?

1. Backsighting
2. Compass
3. Two point
4. Resection

8-16. Horizontal location of points may be performed by resection. How, if at all, does location by resection differ from resectioning in orientation?

1. Requires more points
2. Requires occupying a known point
3. Requires more backsights
4. No difference

8-17. Intersection method of surveying is accomplished by which of the following techniques?

1. Set up on unknown points, sight the known points, and then draw plotting rays on the table
2. Set up on known points, sight a unknown point, and then establish it as a known point for the next setup
3. Set up on known points, sight the unknown point, and then draw rays from the known points to plot the unknown point
4. Set up at an known point, sight on the known point, and then measure the angles and distance

8-18. Why is it important to identify points when locating them with radiation rays?

1. They may appear differently from other points resulting in improper sightings
2. You are sighting multiple points from each point and could miss a point
3. You want to ensure proper point verification
4. You need to have proper tie-in to the progressive traverse

8-19. The progressive method of horizontal location is performed in what manner?

1. Establishing several known points from one setup
2. Establishing an unknown point as a known point by alignment and distance for use as the next point
3. Establishing an unknown point as a known point from several previously known points
4. Using an existing traverse to plot all points for the topographic map

8-20. Which of the following advantages apply to plane-table surveying?

1. Errors in measurements are easily checked
2. It reduces the possibility of overlooking important data
3. It combines data collection and the drafting operation
4. Each of the above

8-21. In comparison with the transit-stadia method, how many points are used in the plane-table method for the same degree of accuracy?

1. More points
2. Less points
3. The same amount

8-22. Which of the following disadvantages apply to the plane-table method?

1. Unsuitable for wooded areas
2. Adverse weather conditions
3. More difficult to transport the equipment
4. All of the above

8-23. What method is recommended to keep the blade aligned with the occupied point?

1. Use two triangles to draw a parallel line with the telescope straightedge
2. Use a pin as a pivot point
3. Use two triangles to pivot around a pin
4. Clamp the blade in place

8-24. What is the purpose of using buff or green detail paper?

1. Provides a good background
2. Reduces the glare
3. Absorbs the ink to reduce runs
4. Reproduces well

8-25. In maintaining the plane-table drawing, you should follow which of the following drafting practices?

1. Clean the paper at the end of the day to remove graphite
2. Use a soft lead pencil to prevent smudging
3. Lift the blade when moving it to prevent smudging
4. All of the above

8-26. A possible source of error in your plane-table work is

1. the sights are too short for accurate sketching
2. too few points for good sketching
3. the use of aerial photographs
4. the use of the same points to locate details and contours

8-27. You should ensure which of the following conditions are met to keep mistakes and errors in plane-table work to a minimum?

1. Table is level
2. Orientation is maintained
3. Both 2 and 3 above
4. Perform traverse and detailing simultaneously

8-28. In developing a topographic map, you do NOT need to consider any elevations or utilities outside the survey area.

1. True
2. False

8-29. The first step in developing a topographic map is to

1. perform a reconnaissance survey
2. run a traverse
3. gather all available maps and other pertinent data
4. perform a plane-table survey

8-30. When performing the reconnaissance survey, what task should you be thinking about when planning a plane-table survey?

1. Appropriate setup points
2. Sufficient number of stations
3. Both 2 and 3 above
4. Length of the traverse run

8-31. Traverse stations should be numbered in what manner on the plane-table sheets?

1. In ascending order clockwise
2. In ascending order counterclockwise
3. Same as the stakes in the field
4. In the order each station is reached

8-32. The plane-table work is the final step in the fieldwork.

1. True
2. False

8-33. When you are establishing horizontal control, what other method besides random traversing may be used?

1. Grids
2. Sextant
3. Transit and level
4. Theodolite

8-34. How many base lines should you establish for a grid network?

1. Five
2. Two
3. Three
4. Four

8-35. When surveying along a shoreline and there is no established trench mark, which of the following actions should you take to establish a temporary datum?

1. Take rod readings at hourly intervals
2. Take rod readings at high and low tide, then average
3. Set up a tide gauge
4. Establish a TBM at the waterline

Learning Objective: Identify and interpret Mercator, transverse Mercator projections, and military maps.

A. Mercator

B. Conic

C. Gnomonic

Figure 8A

IN ANSWERING QUESTIONS 8-36 AND 8-37, USE THE TERMS IN FIGURE 8A.

8-36. The earth's surface is projected on a plane tangent to the equator in this type of projection.

1. A
2. B
3. C

8-37. The earth's surface is projected onto a cylinder in this type of projection.

1. A
2. B
3. C

8-38. A Mercator projection increases distortion as you move in what direction?

1. East or west from 0° longitude
2. South of the Arctic circle
3. North of Antarctica
4. North or south from the equator

8-39. Standard Mercator projections provide excellent data of the polar regions.

1. True
2. False

8-40. A transverse Mercator projection is a Mercator projection that is altered in what manner?

1. Rotated to tangent to the Tropic of Cancer
2. Rotated 45° to lessen the distortion of the higher latitudes
3. Rotated 90° tangent to a meridian
4. Altered to show all features in the proper prospective

8-41. The military grid system is derived for what projection?

1. Conic
2. Mercator
3. Transverse Mercator
4. Gnomonic

8-42. On the globe the parallels become shorter towards the poles. Their length is proportionate to what?

1. Sine of the parallel
2. Cosine of the parallel
3. Sine of the latitude
4. Cosine of the latitude

8-43. The basic arrangement of grids based on the transverse Mercator projection is divided in what manner between latitude 80°S and 84°N?

1. 6° longitude by 8° latitude zones
2. 100,000-meter squares
3. 8° longitude by 6° latitude zones
4. 6° longitude by 12° latitude zones

8-44. In a transverse Mercator grid system, each polar region is divided in what manner?

1. Same as all other regions
2. Into two zones
3. Into 100,000-meter squares
4. Zones A and B

8-45. In a grid system, each 100,000-meter square is divided into (a) how many columns and (b) designated in what manner?

1. (a) 6 (b) numbered 0 through 9
2. (a) 6 (b) lettered A through Z with I and O omitted
3. (a) 8 (b) lettered A through Z with I and O omitted
4. (a) 12 (b) alphanumeric

8-46. What value is assigned to the equator to prevent dealing with negative values south of the equator?

1. 10,000,000 meters and the value increases toward the South Pole
2. 10,000,000 meters and the value decreases toward the South Pole
3. 500,000 meters and the value increases toward the South Pole
4. 500,000 meters and the value decreases toward the South Pole

8-47. The value assigned to the central meridian to prevent dealing with westerly values is called

1. a false easterly value
2. a false westerly value
3. a false northing value
4. a false southing value

8-48. You are using a military grid map and you provide a six-digit coordinate for a location. How accurately have you located this point?

1. Within a 1000-meter square
2. Within a 100-meter square
3. Within a 10-meter square
4. Within a 1-meter square

8-49. Figures 9-18 and 9-19 show some of the marginal information of the frid map. Which of the following items are part of the marginal information?

1. Index to state boundaries
2. Latitude and longitude of the SW corner of the grid map
3. Both 1 and 2 above
4. Grid north

Learning Objective: Identify concepts of conic, gnomonic, and polyconic projections. Recognize characteristics of conformality.

8-50. In figure 9-20, what point is the apex of the cone?

1. North Pole
2. South Pole
3. Equator
4. 30th parallel

8-51. What is the difference between a gnomonic projection and a conic projection of the polar region?

1. In the gnomonic projection, the cone is cut and flattened out to form a map; whereas, the conic projection will appear as is
2. In the gnomonic projection, the points lying close together on either side of the meridian along which the cone is cut will be widely separated on the map; whereas, the conic projection will give a continuous and contiguous view of the area
3. In the conic projection, the cone is cut and flattened out to form a conformal map; whereas, the gnomonic projection will appear as is
4. In the conic projection, the cone is cut and flattened out to form a map; whereas, the gnomonic projection will appear as is

8-52. A Mercator projection is useful as a navigational chart due to which of the following factors?

1. Directional conformity only
2. Distance conformity only
3. Distance and directional conformity
4. Distance conformity and near directional conformity

8-53. Conformity for projections meets which of the following descriptions?

1. Meridians are parallel to each other and equidistant from parallels
2. Direction is relative to the point occupied
3. Distance is proportional to the location
4. Distance scale is the same for north and south as east and west

8-54. What is the disadvantage in using a Mercator projection for surveying purposes?

1. Mercator projections of the equatorial regions are impossible
2. Mercator projections provide relatively large-area maps that are conformal in distance only
3. The parallels are slightly curved. They are neither parallel nor precise
4. No distance scale can be consistently applied to all parts of the Mercator projections

8-55. A polyconic projection has near conformal direction due to what factor?

1. Largs-area maps are projected onto several cones and the spliced together
2. Small-area maps are projected onto several cones and built around a central meridian
3. Small-area maps are projected on more than one cone to have parallel meridians
4. Small-area maps are projected on more than one cone to have parallels perpendicular to meridians

8-56. Which of the following statements regarding great circles are true?

1. All parallels are great circles
2. All meridians are great circles
3. The equator is a great circle
4. Both 2 and 3 above

8-57. A nautical mile is equivalent to

1. 1 minute of longitude
2. 1 minute on an arc on a great circle
3. 1 minute of latitude
4. Both 2 and 3 above

8-58. What map projection is used as a base for the state coordinate systems for zones whose greater dimension is north-south?

1. Transverse Mercator projection
2. Lambert conformal conic projection
3. Polyconic projection
4. Gnomonic projection